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Disaster Response Preparedness and Training: A Capabilities Assessment of the Asia Pacific Military Health Exchange

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for August 2016 to September 2017**

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14. ABSTRACT The purpose of this study was to address gaps in understanding how military personnel involved in casualty transport would function with military and civilian counterparts in the event of a disaster involving multinational response. The aim was to assess capabilities and inform future decisions related to interoperability in casualty transport. Program evaluation informs decision-making for a specific program, in this case, disaster response preparedness of member nations of the Asia Pacific Military Health Exchange. A capabilities assessment employing a 22-item questionnaire via Survey Monkey® was distributed to Asia Pacific Military Health Exchange participants who attended the 2016 meeting. A link to the questionnaire gathering demographic information and facts about disaster response preparedness and training was emailed to attendees of the meeting. Forty-nine participants from 14 different countries responded. Fisher's exact test revealed no differences in disaster response preparedness training except as it related to knowledge of civilian training. Qualitative analysis of free text responses revealed major themes of need for additional training in leadership/communication, austere/realistic training environment, interoperability between and among military and civilian players, and role knowledge and triage. This program evaluation increased knowledge of commonalities and gaps related to disaster preparedness training among military colleagues in the Asia Pacific region. More research is needed to refine disaster preparedness training with international partners.					
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1.0 SUMMARY

The purpose of this study was to address gaps in understanding how military personnel involved in casualty transport would function with military and civilian counterparts in the event of a disaster involving multinational response. The aim was to assess capabilities and inform future decisions related to interoperability in casualty transport. A program evaluation employing basic survey inquiry provided new knowledge about disaster preparedness training among Asia Pacific partners and elicited key training needs. More research is needed to further develop transcultural interoperability, particularly in the area of disaster response.

2.0 INTRODUCTION

The military's role in providing humanitarian aid and disaster response (HADR) provides real-world opportunities to practice casualty transport in austere anti-access/area denial environments. Other than wartime, conflict, and combat operations, HADR missions provide unparalleled opportunities to keep the critical casualty evacuation and en route care skills current. The following research project addressed an identified gap in understanding how casualty transport could occur in platforms other than war.

3.0 BACKGROUND

Disaster preparedness is a critical issue for military and healthcare leaders. Major disasters both on U.S. soil and abroad have captured world attention: recent spate of hurricanes [United States and territories 2017], Gorkha earthquake [Nepal 2015], Typhoon Hagupit [Philippines 2014], and tsunami and resultant nuclear event [Japan 2012], to name a few. Disasters on this scale require more than one nation's resources and response. The Indo-Asia Pacific region is highly populated and geologically prone to natural disasters with enormous potential to inflict devastating casualties. Since the military is best equipped to manage global operations, medical military members of the Indo-Asia Pacific nations initiated efforts over the past decade to exchange healthcare-related information, research, and strategy to contend with challenges common to all of these nations, particularly natural disasters.

The Asia Pacific Military Health Exchange (APMHE) is an annual military medicine event that combines the features of three previously separate medical, nursing, and leadership information exchanges into a single event. APMHE was developed to foster information and knowledge sharing between U.S. Department of Defense (DoD) and non-DoD entities to further shared aims. Disaster preparedness and response is a key commonality between U.S. and Asian military members. Despite language or cultural differences, the need to rescue and evacuate casualties is a shared priority in disaster preparedness and response. While recent Operation Enduring Freedom and Operation Iraqi Freedom conflicts have given U.S. Air Force (USAF) aeromedical evacuation (AE) ample opportunities to demonstrate agile performance in austere and challenging conflict environments, it is less well understood how effective AE would operationalize in non-traditional en route care (ERC) platforms. The Air Force Medical Service's Capabilities Based Assessment (2015) identified that the Air Mobility Command seeks to improve the ability to transport casualties in nontraditional expeditionary care platforms.

This priority was aligned against Strategic Objectives A1 (Enhance the En Route Care System) and E6 (Empower Continuous Process Improvement and Innovation).

USAF AE would be called upon to support disaster response, but how would that response operationalize in a multinational disaster response effort? Military members of the nations affected by disasters would be called upon to work together with U.S. members in the response effort, but how would the various players collaborate and work together? Aircrews are responsible for the flight component of AE, while physicians, nurses, and flight technicians provide patient care and transport functions across the spectrum of ERC. Medical planners and administrators provide necessary planning and logistics for disaster recovery operations. In a disaster scenario, both providers and planners need to effectively work together to ensure safe and efficient ERC of disaster survivors. Just how that collaboration and teamwork would come together with international counterparts is unclear. A commonality of the key players is that we all train for disaster preparedness and response; this commonality provided a springboard to answer the larger research questions noted above.

The goal of this inquiry was to assess the capabilities related to disaster preparedness among these key players, specifically U.S. and international military personnel participating in APMHE. Past meetings of APMHE indicate a robust agenda of relevant topics germane to this assessment.^{1,2} The APMHE forum offered a unique opportunity to have multinational participants in one location to gather relevant information on disaster preparedness training and capabilities. Additionally, the face-to-face interaction framed in an agenda of knowledge and cultural sharing would foster relationships necessary for disaster response in the AE of survivors.

The specific aims of this project were fourfold:

1. Determine status quo of disaster preparedness in APMHE participants (members of medical, nursing, medical service corps) attending 2016 meeting
2. Determine gaps in disaster preparedness of APMHE participants as noted above
3. Assess current capabilities of APMHE participants to work together in care of disaster survivors
4. Identify specific interventions for the future to enhance collaboration and build relationships among APMHE participants

4.0 RESEARCH DESIGN AND METHODS

4.1 Design

The problem addressed was a lack of knowledge about how military personnel involved in casualty transport would be able to function with their military counterparts in the event of a disaster involving multinational response. Little is known about how military personnel of other nations train for disaster response. In the event of a multinational disaster, USAF personnel have been and will continue to be involved in the care and evacuation of survivors. The need to seamlessly integrate with military counterparts is a given, but there is a lack of knowledge and understanding on how that would operationalize. Compounding the problem of this lack of knowledge about training, past HADR efforts have been fraught with logistic and communication challenges that were exacerbated by failure to anticipate and recognize cultural factors influencing relief and recovery efforts (e.g., survivors reluctant to leave their homes for fear of looting or becoming displaced). A research method was needed that would consider this

problem in a more holistic light, particularly in relation to weighing cultural factors. Program evaluation was a logical choice to explore this issue and shed light on the research questions.

Program evaluation is a method that informs decision-making for a specific program,³ in this case, disaster response preparedness training and capabilities of member nations of APMHE. Grounding this inquiry in theory provided a scientific framework for considering the research aims and questions.

Evaluation theory and practice blossomed in the United States over the past 60 years. Newcomer, Hatry, and Wholey⁴ identify the following significant influences, listed chronologically:

- U.S. defense forces vast expansion in response to perceived Soviet threats (1950s)
- Proliferation of new laws protecting civil rights of minorities and persons with disabilities (1960s)
- Movement to hold educational and social reforms accountable for resource utilization and meeting objectives (1970s)
- Government response to catastrophic events/disasters (i.e., Hurricane Katrina) (2000s)
- Current climate of accountability across organizations (present)

Stufflebeam describes program evaluation as “assessments of any coordinated set of activities directed at achieving goals” (p. 10).³ Training for disaster response preparedness is one piece of the “set of coordinated activities directed at achieving the goal” of disaster response preparedness. Therefore, program evaluation was well suited to frame this scientific inquiry.

Paraphrasing, the human condition is to be vulnerable to disasters that naturally occur in every corner of the globe. Every nation has some form of disaster response preparedness. Military forces tend to have more readily available resources to respond and robust training is ingrained in military culture. Gaining knowledge and understanding of how respective member nations in APMHE train for disaster response preparedness lent itself to a capabilities assessment, or program evaluation.

This method of inquiry and assessment was selected to meet the knowledge and evaluation needs of the various stakeholders. The capabilities assessment was a basic inquiry using survey method to determine how APMHE members (U.S. and their counterparts) train for disaster response. The ultimate aim was to assess capabilities in the current system to inform future decisions related to interoperability with other nations in casualty transport in nontraditional ERC platforms.

The capabilities assessment performed in this effort included:

1. Disaster response preparedness training and capabilities of member nations of APMHE
2. Specific inquiry of stakeholders’ report of their own disaster response preparedness training
3. Perceptions of greatest disaster preparedness training need

An essential component of program evaluation is engagement of various stakeholders and communicating results back to them. Therefore, the design of this study included the researcher attending the APMHE meeting immediately following the conclusion of the project and sharing the results with the stakeholders.

4.2 Methods

4.2.1 Population and Sample. The population of interest was military medical members of Asia Pacific nations participating in APMHE. A convenience sample of the population was drawn from the attendees of the APMHE 2016 in Kuantan, Malaysia. The researcher had sought, but was denied, permission ahead of the event to distribute the survey during the meeting. However, conference planners encouraged the researcher to use the networking opportunities of the meeting venue to solicit participation post-event. Both the principal investigator (PI) and an associate investigator (AI) attended the meeting and cultivated numerous contacts from the nursing, medical, and medical service (administrator) corps. Contacts expressed a high level of interest and enthusiasm, not only for this project, but for future research collaboration in general. Both the PI and AI were stationed in the Asia Pacific region in the past and had first-hand knowledge of cultural considerations, particularly in dealing with military and civilian healthcare professionals. This cultural knowledge influenced every part of the encounters, specifically on how we broached the topic of engaging research participants, the order in which we addressed members in a group, and expressing respect and professionalism in a more serious and sober manner than we may have used with U.S. colleagues. For example, we understood that introductions and the exchange of business cards are formal encounters in some Asian cultures, and we took time to establish rapport with international colleagues before pursuing our own research agenda.⁵ Taking deliberate measures to honor customs and courtesies helped ensure that professional relationships began on sure footing. Additionally, we took great care in every conversation to build inclusion among the attendees, who were representing various nations, ranks, and medical occupations. For example, in the U.S. military system, nurses are considered professionals and hold officer rank, while in many member nations of APMHE, nurses are viewed more as technicians and hold enlisted rank. Hierarchy differences between physicians and other healthcare providers are more pronounced in Asia Pacific nations than in some western countries.^{6,7} The researchers were keenly sensitive to these cultural issues during all interactions. Colleagues who expressed particular interest and enthusiasm were asked to participate in reviewing the items and responses at later phases of the project. Even though it was not a formal aim of this study, we strove to establish and cultivate relationships for future research collaborations.

4.2.2 Survey Development. Following APMHE 2016, held in August 2016, a basic survey questionnaire using Survey Monkey® was developed (Appendix A). The questionnaire included items on demographic information and factual responses about the nature of disaster preparedness and disaster response training. The majority of the items sought quantitative data and required binary or discrete number of responses, e.g., does training currently occur, does it include civilian or multinational counterparts, etc. A few items allowed for a response of “Other” to ensure respondents could provide clarification on answers that were not identifiable in the response choices. The final item sought qualitative data from an open-ended question, asking what respondents thought was the greatest disaster preparedness training need. A U.S. nurse scientist with subject matter expertise in using Survey Monkey® reviewed and edited the draft. To validate understandability and cultural appropriateness, the items in the Survey Monkey® format were sent to four attendees with research experience who had expressed interest in collaborating with the PI during the APMHE 2016 meeting. Nurse researchers from Thailand, Republic of South Korea, and Nepal, and a physician researcher from Bangladesh, reviewed the

full questionnaire and provided feedback and validation. Two of these individuals suggested small edits for language clarity, which the researcher made. This final and revised version was then shared and reconfirmed with them before disseminating.

4.2.3 Solicitation of Participants. Once the survey development process had completed (April 2017), the link to the survey was emailed directly to 69 APMHE participants (members of medical, nursing, medical service corps) who actually attended the 2016 meeting. Recipients were encouraged to disseminate the link to their military and civilian colleagues whether or not the colleagues actually attended the meeting. It is worth noting that while there is no fee to attend APMHE meetings, attendees bear the entire cost of travel and lodging themselves or through sponsorship of their respective service units. Fiscal realities did not permit more than a few representatives of each nation to attend, and some member nations were unable to send anyone. Therefore, in an attempt to build the sample size and be more inclusive, those who were able to attend were encouraged to share the link with those who were not able to attend. Additionally, the link to the questionnaire was posted on the APMHE website and Facebook pages. Participants were asked to fill out a questionnaire gathering simple demographic information and facts about disaster response preparedness and training, as well as provide free text responses indicating what they perceived to be the greatest training need.

Initial response was sluggish, with less than 10 respondents in the first 2 weeks. Several of the email addresses proved to be undeliverable due to the inevitable time lag between the face-to-face meeting in August 2016 and the email communication inviting participation in April 2017. The PI verified the links from Survey Monkey®, the APMHE webpage, and Facebook were all functioning, as a few individuals had emailed that the Survey Monkey® link was not working. After correcting it, the PI sent a new email invitation, encouraging recipients to share the invitation with colleagues, especially those who may have already relocated or received new email addresses (a frequent occurrence with military position relocation). Ultimately, a total n of 49 was achieved by the time data collection closed in June 2017. Of note, all respondents participated via the email link to Survey Monkey®. No one responded through the APMHE webpage or Facebook link.

4.2.4 Data Analysis. A statistician was included early in the study design and planning phases. In addition to simple descriptive statistics, the plan was to use a chi square analysis to compare responses between and among groups. Ultimately, a Fischer's exact test was the most accurate way to analyze the quantitative data, which fully addressed aim 1 (determine status quo of disaster preparedness in APMHE participants) and partly addressed aim 2 (determine gaps in disaster preparedness of APMHE participants).

Qualitative methods were needed to analyze the free text responses and fully realize aim 2 (determine gaps in disaster preparedness of APMHE participants). Qualitative data came from two avenues within the survey: items that allowed a response of "Other" and provided a field to enter free text and from the final open-ended question. Basic qualitative analysis requires the organization and interpretation of data that come from the respondents' own words to discover the underlying themes, categories, and patterns of information.⁸ Inherent in qualitative inquiry is a flexible approach to research design, understanding that the respondents themselves are integral to the collection and analysis of this type of rich human data. The nature of qualitative inquiry is precisely why the researcher took deliberate measures to include in-person attendance at the APMHE meeting in the initial study design. The ability to engage potential participants in

a culturally sensitive manner, realizing their input and feedback would be needed to assist in analyzing and confirming the qualitative data, was critical to the design and implementation of this study. Further, achieving study aims 3 (assess current capabilities of APMHE participants to work together in care of disaster survivors) and 4 (identify specific interventions for the future to enhance collaboration and build relationships among APMHE participants) required future, ongoing collaboration employing the data gleaned from the study.

Data analysis in this study employed basic qualitative methods and began with accurately transcribing verbatim responses and examining them for commonalities. Recurring words (i.e., training, triage) were counted to quantify the instances they occurred. The researcher employed analytical coding of responses that were less straightforward, especially in cases where participants were unable to respond in their language of choice and fluency. For example, the response “profession and following the rule” required the researcher to interpret and reflect on the meaning before assigning a code.⁹ This led to identifying common themes and concepts. An organizational chart of the themes and concepts was developed, with an accompanying comparison of respondents’ data alongside the researcher’s analysis. The same individuals who provided input and feedback on the survey items were invited to review the qualitative data and researcher’s analysis to either confirm or correct my interpretations. Input from these other researchers confirmed the investigator’s analysis and were absent any corrections or suggested changes. These same collaborators had previously offered substantive (although minor) suggestions for wording changes in the survey items, so I was confident that their confirmation of my interpretations and qualitative analysis was genuine and not unduly influenced by a desire to simply agree. Finally, the PI requested a further review of the qualitative data and findings from a colleague not associated with the project whose area of expertise is in qualitative research. While this additional review and confirmation was not in the original research design, the practice of seeking a further objective appraisal reduces bias and adds strength to research conclusions.⁸

5.0 RESULTS

5.1 Quantitative Results

5.1.1 Sample Description. A total n of 49 completed the survey. Respondents were almost evenly split between United States (28, 57%) and Asia Pacific (21, 43%) (Figure 1). Sample characteristics and demographic descriptors were also without significant differences (Table 1). Most respondents were active duty (45, 92%), officers (47, 96%), belonged to the nurse corps (41, 84%), and had greater than 10 years of military service (34, 69%). A majority of respondents belonged to their nation’s air force (35, 71%) and received their professional/occupational education from a civilian institution (39, 80%). A preponderance of respondents (29, 59%) indicated a graduate degree as their highest level of education. Those with a baccalaureate ranked next (18, 37%), and a few (2, 4%) indicated vocational/technical training as their highest level of completed education. Responses to identification of a unit position or duty title varied, but most identified as either clinician (18, 37%) or administrator (12, 24%).

What Country Do You Represent?

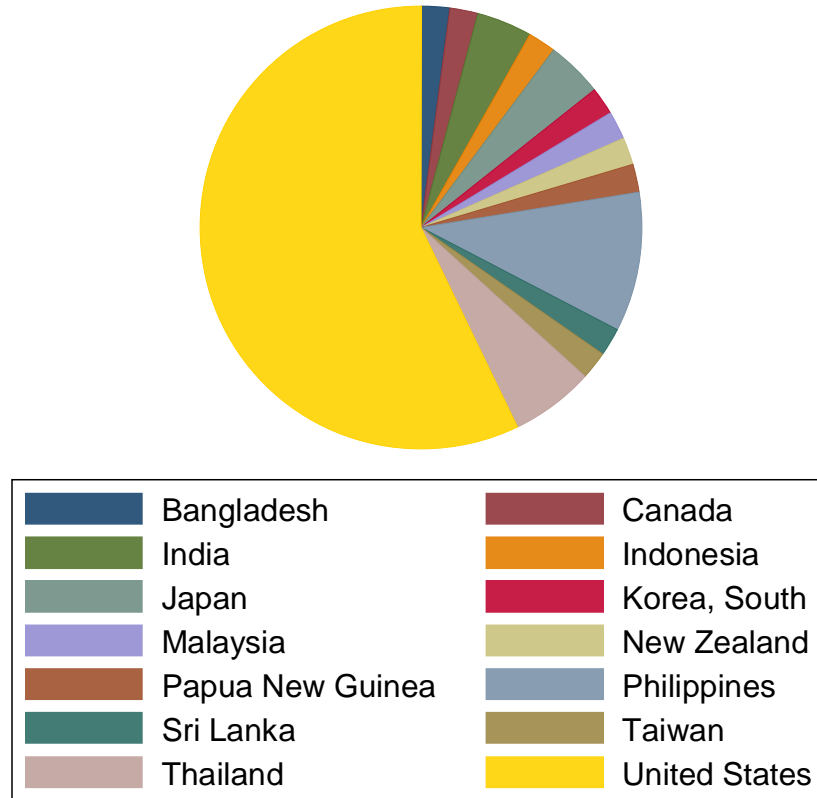


Figure 1. Country of representation.

5.1.2 Disaster Preparedness Specific Items. A Fischer's exact test were calculated on each of 11 items with discrete response choices (Table 2). Simple frequencies were reported for free text item responses to questions answered with a response of "Other" that permitted the respondent to provide more detail (Table 3). In 9 of the 11 quantitative items, no differences were reported among or between U.S. and Asia Pacific respondents. The two items that revealed a difference ($p < 0.05$) related to knowledge of disaster preparedness training among the respondents' civilian counterparts. In response to the question *How often do your civilian counterparts train for disaster preparedness?*, 6/13 Asia Pacific respondents replied with a discrete answer of either "every 6 months" or "yearly." Seven respondents indicated "not sure." Comparatively, all U.S. respondents who answered this question ($n=10$) indicated "unsure." The next question was *Do civilian and military members in your profession train together for disaster preparedness?* Again, 12/13 Asia Pacific respondents answered a discrete "yes" or "no" and only one indicated "not sure," while all 10 U.S. respondents indicated "not sure."

Table 1. Demographic Item Responses

Question		United States	Asia Pacific	Total	Fisher's Exact <i>p</i> -value
Attended the APMHE in 2016?		6 (21.4%)	15 (78.9%)	21 (44.7%)	<0.001
Does your country have active duty and Reserve military components?		28 (100%)	19 (90.5%)	46 (93.9%)	NA
To which military service branch or branches do you belong?	Air Force	26 (74.3%)	9 (42.9%)	35 (71.4%)	<0.001
	Air Force, Retired	1 (3.6%)	0	1 (2.0%)	
	Army	1 (3.6%)	7 (33.3%)	8 (16.3%)	
	Health Service	0	1 (4.8%)	1 (2.0%)	
	Navy	0	2 (9.5%)	2 (4.1%)	
	Nurse Corps	0	1 (4.8%)	1 (2.0%)	
	Technical & Administrative	0	1 (4.8%)	1 (2.0%)	
Are you active duty or Reserve?	Active Duty	26 (92.9%)	19 (90.5%)	45 (91.8%)	0.84
	Reserve	1 (3.6%)	1 (4.8%)	2 (4.1%)	
	Not Applicable	1 (3.6%)	0	1 (2.0%)	
	Missing	0	1 (4.8%)	1 (2.0%)	
To which medical field/corps do you belong?	Dental	0	1 (4.8%)	1 (2.0%)	0.07
	Medical	2 (7.1%)	5 (23.8%)	7 (14.3%)	
	Nurse	26 (92.9%)	15 (71.4%)	41 (83.7%)	
Where did you receive your training?	Civilian School	26 (92.9%)	13 (61.9%)	39 (79.6%)	0.01
	Military School	1 (11.1%)	8 (38.1%)	9 (18.4%)	
	Both (NTP)	1 (11.1%)	0	1 (2.0%)	
What is your highest level of education?	Baccalaureate Degree	13 (46.4%)	5 (23.8%)	18 (36.7%)	0.21
	Graduate Degree	14 (50%)	15 (71.4%)	29 (59.2%)	
	Vocational/Technical Training	1 (3.6%)	1 (4.8%)	2 (4.1%)	
In the military, are you	Civilian	1 (3.6%)	0	1 (2.0%)	0.99
	Enlisted	1 (3.6%)	0	1 (2.0%)	
	Officer	26 (92.9%)	21 (100%)	47 (95.2%)	
How many years have you served in the military?	Less than 5 years	6 (21.4%)	3 (14.3%)	9 (18.4%)	0.74
	Between 5 – 10 years	4 (14.3%)	2 (9.5%)	6 (12.2%)	
	More than 10 years	18 (64.3%)	16 (76.2%)	34 (69.4%)	

5.2 Qualitative Results

The questionnaire concluded with one open-ended question that sought qualitative data, *What do you think is the greatest disaster preparedness training need?* While this was only one item on the survey, it yielded the most detailed data to inform study aims 2, 3, and 4. Most participants (39, 80%) provided free text responses to the final question. All responses were analyzed using basic principles of qualitative research. Due to the relatively small sample size and that only one item was involved, the analysis was done manually, without any formal software program assistance.

Table 2. Disaster Preparedness Training Specific Items

Question	Response	United States	Asia Pacific	Total	Fisher's Exact <i>p</i> -value
Do members in your military train for disaster preparedness?	No	2 (7.1%)	0	2 (4.1%)	0.49
	Yes	25 (89.3%)	19 (90.5%)	44 (89.8%)	
	Not sure	1 (3.6%)	2 (9.5%)	3 (6.1%)	
Do all military members in your unit train for disaster preparedness in the same way?	No	8 (33.3%)	8 (44.4%)	16 (38.1%)	0.56
	Yes	12 (50%)	9 (50%)	21 (50%)	
	Not sure	4 (16.7%)	1 (5.6%)	5 (11.9%)	
Do your civilian counterparts in your country train for disaster preparedness?	No	4 (14.3%)	1 (5%)	5 (10.4%)	0.36
	Yes	12 (42.9%)	13 (65%)	25 (52.1%)	
	Not sure	12 (42.9%)	6 (30%)	18 (37.5%)	
How often do your civilian counterparts train for disaster preparedness?	Every 6 months	0	1 (7.7%)	1 (4.3%)	0.02 ^a
	Yearly	0	5 (38.5%)	5 (21.7%)	
	Not sure	10 (35.7%)	7 (53.9%)	17 (73.9%)	
Do civilian and military members in your profession train together for disaster preparedness?	No	0	6 (46.1%)	6 (26.1%)	0.02 ^a
	Yes	7 (70%)	6 (46.1%)	13 (56.5%)	
	Not sure	3 (30%)	1 (7.7%)	4 (17.4%)	
Does your military unit train for disaster preparedness on an international level?	No	12 (46.1%)	9 (45%)	21 (45.6%)	0.86
	Yes	7 (26.9%)	7 (35%)	14 (30.4%)	
	Not sure	7 (26.9%)	4 (20%)	11 (23.9%)	

^a*p*<0.05.

The researcher organized the qualitative data in the most visually clear and simple manner possible (Appendix B). The individuals providing the confirmation of the interpretation, while all researchers in their own right, were not primarily fluent in the English language. Therefore, italics, parentheses, color coding, etc. were liberally used to help those providing confirmation a clear way to see how the data were organized. The computer assigned each respondent's answer a number, and the researcher analyzed the responses using the same number to match an attached Excel spreadsheet of responses so that those providing confirmation had access to the exact same data as the researcher. The precise words of the response appeared first, abbreviated in many cases to result in just one or a few words. Next to the response word(s), the researcher provided an interpretation/synopsis of the response in italics and in parentheses. For example, one respondent answered only the single word "equipment." This was interpreted to mean that the respondent thought there was a training need related to equipment, so it was recorded verbatim as "equipment" but with the coding category of "training." The interpretation was provided (*in italics in parentheses*) so that it would be visually clear to the other collaborating researchers reviewing the data what the respondent stated compared to what the researcher interpreted. The researcher identified major themes from all of the responses based on the number of occurrences of a word, idea, or concept and identified them separately as major themes.

Table 3. Breakout for Frequency of Training

How often do you train for disaster preparedness?	United States	Asia Pacific	Total	Fisher's Exact p-value
Every 6 Months	4 (40.00%)	6 (28.57%)	10 (20.41%)	0.726
Every 2 Years	1 (3.57%)	0	1 (2.04%)	
Not Sure	11 (39.29%)	8 (36.10%)	19 (38.78%)	
Other (Please Specify)	7 (25.00%)	4 (19.05%)	11 (22.45%)	
Not Applicable	1 (3.57%)	0	1 (2.04%)	
Missing	4 (14.29%)	3 (14.29%)	7 (14.29%)	
Total	28 (100%)	21 (100%)	49 (100%)	

If Other Above (Specify)	United States	Asia Pacific	Total
Monthly	1 (14.29%)	0	1 (9.09%)
Every other month	1 (14.29%)	0	1 (9.09%)
Every 2-3 months	1 (14.29%)	0	1 (9.09%)
Every other month/once a quarter	1 (14.29%)	0	1 (9.09%)
Quarterly	1 (14.29%)	0	1 (9.09%)
As trainer, it depends on how many programs I am involved with	0	1 (25.00%)	1 (9.09%)
Depends on availability of training	0	1 (25.00%)	1 (9.09%)
Depends on the unit. Operational units train for many eventualities whereas clinics not so much	0	1 (25.00%)	1 (9.09%)
Very rarely	1 (14.29%)	0	1 (9.09%)
Depends on command	1 (14.29%)	0	1 (9.09%)
Disaster preparedness training is not regularly offered	0	1 (25.00%)	1 (9.09%)
Total	7 (100%)	4 (100%)	11 (100%)

The seven major themes/concepts identified, with the number of occurrences noted in parentheses, are

- Training (18)
- Leadership, Communication (10)
- Realistic (6)
- Austere (5)
- Interoperability (4)
- Role knowledge (4)
- Triage (3)

It was not surprising that “training” was the most commonly used word and evolved into an overarching theme, since the question asked the respondent to identify “the greatest disaster preparedness training need.” This sample clearly echoed the value of training that is inherent to military culture. Leadership and communication were the next most frequently occurring response themes and reflect the emphasis on unified command that both military and civilian disaster education models highlight. What was surprising was the number of responses that specifically identified the need for more realistic and austere situational training. For example, comments like “...get rid of computer-based training...too many things are simulated” and “realistic...no cell phones, sourcing water, resupply...” reflected acknowledgment that training experiences may need to be less comfortable, brief, and relatively easy as experienced by these respondents. The concept of interoperability presented itself both as distinctly stated (“interoperability between civilian and military sector”) and within the meaning of respondents’ own words (“interfly” and “how to work together on local and international level”). The theme of a training need around the concept of role knowledge was identified from comments such as “everybody should have a clear knowledge what to do” and “everyone feels like they have a role and knows what it is.” Triage was a verbatim term that appeared distinctly within the response on just three occurrences. However, it merited appearing on the list of overall themes/concepts because triage is so integral to direct patient care and embedded as such in other responses (“it needs to move for the quick response on the disaster victims” and “casualty tracking”).

6.0 DISCUSSION

6.1 Aims

The specific aims of this study were fourfold:

1. Determine status quo of disaster preparedness in APMHE participants (members of medical, nursing, medical service corps) attending 2016 meeting
2. Determine gaps in disaster preparedness of APMHE participants as noted above
3. Assess current capabilities of APMHE participants to work together in care of disaster survivors
4. Identify specific interventions for the future to enhance collaboration and build relationships among APMHE participants

The first aim, *determine status quo of disaster preparedness in APMHE participants (members of medical, nursing, medical service corps) attending 2016 meeting*, was achieved through the survey. Although the overall sample size was small ($n = 49$), responses were varied in country of origin, branches of the military, and healthcare provider role. To date, no other documented capabilities assessment of this population has been done; this project accomplished that objective. Training and disaster preparedness and response are frequent topics on meeting agendas, particularly within the APMHE, but prior to this study, there were no specific data on the status quo. This study found that there were no differences between the responses of U.S. and Asia Pacific nation participants except in the area of knowledge of disaster preparedness training in their respective civilian counterparts. Where all of the U.S. respondents indicated “unsure” when queried on their knowledge of disaster preparedness training frequency in the civilian community, respondents from Asia Pacific nations reported discrete answers. When asked if

military and civilians train together for disaster preparedness, every one of the U.S. respondents who answered this question chose “unsure” as the response, while Asia Pacific respondents indicated firm answers.

Acknowledging the sample size is small, it is significant that Asia Pacific respondents indicated awareness of disaster preparedness training with their civilian counterparts, where U.S. respondents did not. This finding sparks questions that require further research to draw firm conclusions, but there are some interesting hypotheses to consider. Perhaps Asia Pacific nations, by virtue of being more numerous and smaller in land mass than the United States, feel a keener need for joining their military forces with civilians in disaster response. Relationships between military and civilians may be more interdependent in Asia Pacific nations because of differences in resource sharing. Cultural factors among these respondents perhaps influence greater awareness of civilian counterparts and less aloofness in planning and executing disaster preparedness training. While this study did not explore these questions, the findings may prompt further inquiry.

The second aim, *determine gaps in disaster preparedness of APMHE participants*, was achieved through the qualitative analysis of the final item directly soliciting beliefs on priority gaps in disaster preparedness training. Responses provided data to identify seven major themes/concepts of disaster preparedness training needs. The gap themes identified in this study are in step with past and contemporary training efforts except in perhaps one significant way: the desire for more austere and realistic training. In an effort to contain cost and meet competing mission requirements, military training efforts have relied heavily upon “just-in-time” and computer-based training. Rather than being relieved of the requirement for time-consuming and uncomfortable training exercises (i.e., exercising in mission oriented protective posture (MOPP) gear, outdoors in extreme weather elements, etc.), respondents in this study specifically requested training opportunities that would be in field conditions deprived of common conveniences (i.e., cell phones). These identified gaps and specific feedback and suggestions will provide an evidence base upon which to plan and promote future training and policy efforts.

The third aim, *assess current capabilities of APMHE participants to work together in care of disaster survivors*, was partially met by this study. There is certainly more evidence and information than what was previously known on the subject. However, this study was not detailed or exhaustive enough to fully address the current capabilities beyond what was reported. The difference reported in knowledge of civilian training capabilities may pose challenges in future collaborations and capabilities in disaster survivor care. Consider if a rescue operation occurs in an Asia Pacific nation and the host country wants casualties handed off to a civilian facility, but U.S. military members are inclined to retain casualties in a U.S. or joint facility; without trust and strong interdependent relationships, needless conflicts could hamper efforts. Additional research is needed to assess current survivor care capabilities and should include civilians.

The fourth and final aim, *identify specific interventions for the future to enhance collaboration and build relationships among APMHE participants*, was met. As stated above, a specific difference was noted that bears further investigation and could prompt U.S. training plans to include civilians, or at the least, knowledge of disaster preparedness training and efforts in our U.S. civilian counterparts. A list of gaps and themes for future training efforts was identified that could inform future interventions in training, exercises, and policy.

6.2 Strengths and Limitations

The main limitation of this study was the relatively small sample size. It was impossible to know how many individuals in the population of interest were contacted, as the researcher relied on social media and word of mouth to stimulate interest and invite participants. Data collection was initially planned to co-occur with the 2016 APMHE meeting. When the conference planners rejected the request to distribute the survey at the actual meeting, the study was limited to only those potential respondents still interested in the following months. Social media platforms failed to yield any survey respondents. This may have been because those social media links were only of interest to attendees in the time immediately surrounding the August 2016 meeting and not several months later when the survey was fully developed and ready to execute. However, the fact that we were not permitted to distribute the survey during the actual meeting ended up facilitating research collaboration with new colleagues met during the meeting. Ultimately, the inability to distribute the survey at the event, while likely decreasing the overall participation, led to strengthening the study in several different ways. Most importantly, it allowed for development of close collaborations, friendships, and meaningful cultural exchanges essential to the groundwork of future research and disaster recovery efforts.

A distinct challenge to this study was conducting research activities in a foreign environment with many different militaries represented. Although the meetings were held in one location, participants came from great distances and from many different countries speaking different primary languages. Later communications were hampered by time differences, information technology issues (email, network server connectivity, etc.), and military protocol. For example, one nation's military members required commander approval to even log in and take the survey. A relatively large number of otherwise willing candidates chose to not participate rather than draw attention by making the request to their commander.

The use of program evaluation as a method to address the study aims was a strength. The choice to frame this inquiry in an evidence-based approach specifically designed to study large and sprawling programs was reinforced as the study progressed. As stated above, attempting a scientific inquiry involving so many different nations, military branches, and types of healthcare providers, was a challenge in and of itself. Employing program evaluation added structure and rigor to what otherwise may just have been viewed as a simple survey to gather in data. The key strength of program evaluation in this endeavor was the deliberate inclusion of the stakeholders at all phases of survey design, distribution, interpretation, and dissemination.

7.0 CONCLUSIONS

This program evaluation increased knowledge of commonalities and gaps related to disaster preparedness training among military colleagues in the Asia Pacific region. The study aims were met, although further research is needed in understanding the ability to collaborate with Asia Pacific nations in care of disaster survivors. An interesting finding was that Asia Pacific partners expressed more knowledge of how their civilian counterparts train for disaster preparedness than U.S. military participants. The training gaps identified in this study provide an evidence base for planning future training interventions and policy. More research is needed to refine disaster preparedness training with international partners.

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Appendix A

Survey Monkey® Questionnaire

* 1. What Country do you represent? (select only one)

2. Did you attend Asia Pacific Military Health Exchange (APMHE) in 2016?

☐ Yes

☐ No

3. To which military service branch or branches do you belong?

☐ Army

☐ Air Force

☐ Navy

☐ Marines

☐ Other (please specify)

4. Does your Country have Active Duty and Reserve military components?

☐ Yes

☐ No

☐ Other (please specify)

5. Are you Active Duty or Reserve?

☐ Active Duty

☐ Reserve

☐ Not Applicable

6. To which medical field/corps do you belong?

- ☐ Medical
- ☐ Dental
- ☐ Nurse
- ☐ Biological Science
- ☐ Public Health
- ☐ Other (please specify)

7. Where did you receive your entry level training for your medical field/corps (physician, nurse, technician, etc)?

- ☐ Military School
- ☐ Civilian School
- ☐ Other (please specify)

8. What is your highest level of education?

- ☐ Vocational/technical training
- ☐ Baccalaureate degree
- ☐ Graduate degree (i.e., master's degree, PhD, MD, etc.)

9. Which of these military unit position or duty titles apply to you?

- ☐ Leader
- ☐ Researcher
- ☐ Administrator
- ☐ Clinician (nurse, physician, dentist, etc)
- ☐ Other (please specify)

10. In the military, are you...

- ☐ Enlisted
- ☐ Officer
- ☐ Civilian
- ☐ Other (please specify)

11. How many years have you served in the military?

- ☐ Less than 5 years
- ☐ Between 5-10 years
- ☐ More than 10 years
- ☐ Not applicable

12. Do members in your military specialty train for disaster preparedness?

- ☐ Yes
- ☐ No
- ☐ Not sure

13. How often do you train for disaster preparedness?

- ☐ Every 6 Months
- ☐ Yearly
- ☐ Every 2 Years
- ☐ Not sure
- ☐ Not applicable
- ☐ Other (please specify)

14. Do all military members in your unit train for disaster preparedness in the same way?

- ☐ Yes
- ☐ No
- ☐ Not sure

15. Do your civilian counterparts in your country train for disaster preparedness?

- ☐ Yes
- ☐ No
- ☐ Not sure

16. How often do your civilian counterparts train for disaster preparedness?

- ☐ Every 6 Months
- ☐ Yearly
- ☐ Every 2 Years
- ☐ Not sure
- ☐ Not applicable
- ☐ Other (please specify)

17. Do civilian and military members in your profession train together for disaster preparedness?

- ☐ Yes
- ☐ No
- ☐ Not sure

18. Do civilian and military members in your profession train for disaster preparedness in the same way?

- ☐ Yes
- ☐ No
- ☐ Not sure

19. Does your military unit train for disaster preparedness on an international level?

- ☐ Yes
- ☐ No
- ☐ Not sure

20. With which countries does your unit train for disaster preparedness on an international level? (select all that apply)

- | | | |
|---|--|---|
| <input type="checkbox"/> Afghanistan | <input type="checkbox"/> Ghana | <input type="checkbox"/> Norway |
| <input type="checkbox"/> Albania | <input type="checkbox"/> Greece | <input type="checkbox"/> Oman |
| <input type="checkbox"/> Algeria | <input type="checkbox"/> Grenada | <input type="checkbox"/> Pakistan |
| <input type="checkbox"/> Andorra | <input type="checkbox"/> Guatemala | <input type="checkbox"/> Palau |
| <input type="checkbox"/> Angola | <input type="checkbox"/> Guinea | <input type="checkbox"/> Palestinian Territories |
| <input type="checkbox"/> Antigua and Barbuda | <input type="checkbox"/> Guinea-Bissau | <input type="checkbox"/> Panama |
| <input type="checkbox"/> Argentina | <input type="checkbox"/> Guyana | <input type="checkbox"/> Papua New Guinea |
| <input type="checkbox"/> Armenia | <input type="checkbox"/> Haiti | <input type="checkbox"/> Paraguay |
| <input type="checkbox"/> Aruba | <input type="checkbox"/> Holy See | <input type="checkbox"/> Peru |
| <input type="checkbox"/> Australia | <input type="checkbox"/> Honduras | <input type="checkbox"/> Philippines |
| <input type="checkbox"/> Austria | <input type="checkbox"/> Hong Kong | <input type="checkbox"/> Poland |
| <input type="checkbox"/> Azerbaijan | <input type="checkbox"/> Hungary | <input type="checkbox"/> Portugal |
| <input type="checkbox"/> Bahamas, The | <input type="checkbox"/> Iceland | <input type="checkbox"/> Qatar |
| <input type="checkbox"/> Bahrain | <input type="checkbox"/> India | <input type="checkbox"/> Romania |
| <input type="checkbox"/> Bangladesh | <input type="checkbox"/> Indonesia | <input type="checkbox"/> Russia |
| <input type="checkbox"/> Barbados | <input type="checkbox"/> Iran | <input type="checkbox"/> Rwanda |
| <input type="checkbox"/> Belarus | <input type="checkbox"/> Iraq | <input type="checkbox"/> Saint Kitts and Nevis |
| <input type="checkbox"/> Belgium | <input type="checkbox"/> Ireland | <input type="checkbox"/> Saint Lucia |
| <input type="checkbox"/> Belize | <input type="checkbox"/> Israel | <input type="checkbox"/> Saint Vincent and the Grenadines |
| <input type="checkbox"/> Benin | <input type="checkbox"/> Italy | <input type="checkbox"/> Samoa |
| <input type="checkbox"/> Bhutan | <input type="checkbox"/> Jamaica | <input type="checkbox"/> San Marino |
| <input type="checkbox"/> Bolivia | <input type="checkbox"/> Japan | <input type="checkbox"/> Sao Tome and Principe |
| <input type="checkbox"/> Bosnia and Herzegovina | <input type="checkbox"/> Jordan | <input type="checkbox"/> Saudi Arabia |
| <input type="checkbox"/> Botswana | <input type="checkbox"/> Kazakhstan | <input type="checkbox"/> Senegal |
| <input type="checkbox"/> Brazil | <input type="checkbox"/> Kenya | <input type="checkbox"/> Serbia |
| <input type="checkbox"/> Brunei | <input type="checkbox"/> Kiribati | <input type="checkbox"/> Seychelles |
| <input type="checkbox"/> Bulgaria | <input type="checkbox"/> Korea, North | <input type="checkbox"/> Sierra Leone |

<input type="checkbox"/> Burkina Faso	<input type="checkbox"/> Korea, South	<input type="checkbox"/> Singapore
<input type="checkbox"/> Burma	<input type="checkbox"/> Kosovo	<input type="checkbox"/> Sint Maarten
<input type="checkbox"/> Burundi	<input type="checkbox"/> Kuwait	<input type="checkbox"/> Slovakia
<input type="checkbox"/> Cambodia	<input type="checkbox"/> Kyrgyzstan	<input type="checkbox"/> Slovenia
<input type="checkbox"/> Cameroon	<input type="checkbox"/> Laos	<input type="checkbox"/> Solomon Islands
<input type="checkbox"/> Canada	<input type="checkbox"/> Latvia	<input type="checkbox"/> Somalia
<input type="checkbox"/> Cabo Verde	<input type="checkbox"/> Lebanon	<input type="checkbox"/> South Africa
<input type="checkbox"/> Central African Republic	<input type="checkbox"/> Lesotho	<input type="checkbox"/> Spain
<input type="checkbox"/> Chad	<input type="checkbox"/> Liberia	<input type="checkbox"/> Sri Lanka
<input type="checkbox"/> Chile	<input type="checkbox"/> Libya	<input type="checkbox"/> Sudan
<input type="checkbox"/> China	<input type="checkbox"/> Liechtenstein	<input type="checkbox"/> Suriname
<input type="checkbox"/> Colombia	<input type="checkbox"/> Lithuania	<input type="checkbox"/> Swaziland
<input type="checkbox"/> Comoros	<input type="checkbox"/> Luxembourg	<input type="checkbox"/> Sweden
<input type="checkbox"/> Congo, Democratic Republic of the	<input type="checkbox"/> Macau	<input type="checkbox"/> Switzerland
<input type="checkbox"/> Costa Rica	<input type="checkbox"/> Macedonia	<input type="checkbox"/> Syria
<input type="checkbox"/> Cote d'Ivoire	<input type="checkbox"/> Madagascar	<input type="checkbox"/> Taiwan
<input type="checkbox"/> Croatia	<input type="checkbox"/> Malawi	<input type="checkbox"/> Tajikistan
<input type="checkbox"/> Cuba	<input type="checkbox"/> Malaysia	<input type="checkbox"/> Tanzania
<input type="checkbox"/> Curacao	<input type="checkbox"/> Maldives	<input type="checkbox"/> Thailand
<input type="checkbox"/> Cyprus	<input type="checkbox"/> Mali	<input type="checkbox"/> Togo
<input type="checkbox"/> Czech Republic	<input type="checkbox"/> Malta	<input type="checkbox"/> Tonga
<input type="checkbox"/> Denmark	<input type="checkbox"/> Marshall Islands	<input type="checkbox"/> Trinidad and Tobago
<input type="checkbox"/> Djibouti	<input type="checkbox"/> Mauritania	<input type="checkbox"/> Tunisia
<input type="checkbox"/> Dominica	<input type="checkbox"/> Mauritius	<input type="checkbox"/> Turkey
<input type="checkbox"/> Dominican Republic	<input type="checkbox"/> Mexico	<input type="checkbox"/> Turkmenistan
<input type="checkbox"/> East Timor (Timor-Leste)	<input type="checkbox"/> Micronesia	<input type="checkbox"/> Tuvalu
<input type="checkbox"/> Ecuador	<input type="checkbox"/> Moldova	<input type="checkbox"/> Uganda
<input type="checkbox"/> Egypt	<input type="checkbox"/> Monaco	<input type="checkbox"/> Ukraine
<input type="checkbox"/> El Salvador	<input type="checkbox"/> Mongolia	<input type="checkbox"/> United Arab Emirates
<input type="checkbox"/> Equatorial Guinea	<input type="checkbox"/> Montenegro	<input type="checkbox"/> United Kingdom
<input type="checkbox"/> Eritrea	<input type="checkbox"/> Morocco	<input type="checkbox"/> United States

- | | | |
|---|--------------------------------------|-------------------------------------|
| <input type="checkbox"/> Estonia | <input type="checkbox"/> Mozambique | <input type="checkbox"/> Uruguay |
| <input type="checkbox"/> Ethiopia | <input type="checkbox"/> Namibia | <input type="checkbox"/> Uzbekistan |
| <input type="checkbox"/> Fiji | <input type="checkbox"/> Nauru | <input type="checkbox"/> Vanuatu |
| <input type="checkbox"/> Finland | <input type="checkbox"/> Nepal | <input type="checkbox"/> Venezuela |
| <input type="checkbox"/> France | <input type="checkbox"/> Netherlands | <input type="checkbox"/> Vietnam |
| <input type="checkbox"/> Gabon | <input type="checkbox"/> New Zealand | <input type="checkbox"/> Yemen |
| <input type="checkbox"/> Gambia, The | <input type="checkbox"/> Nicaragua | <input type="checkbox"/> Zambia |
| <input type="checkbox"/> Georgia | <input type="checkbox"/> Niger | <input type="checkbox"/> Zimbabwe |
| <input type="checkbox"/> Germany | <input type="checkbox"/> Nigeria | |
| <input type="checkbox"/> Other (please specify) | | |

21. Do you think your military unit is prepared to respond to a disaster?

- ☐ Yes
- ☐ No
- ☐ Not sure

22. What do you think is the greatest disaster preparedness training need?

Appendix B

Qualitative Analysis of Free Text Responses Item #30

Everyone who filled out the survey was asked this question:

What do you think is the greatest disaster preparedness training need?

Thirty-nine of 49 participants answered this question in their own words. The computer assigned each respondent's answer a number and I analyzed the responses below using the same number to match the Excel spreadsheet.

The exact words of the responses appear first. In many cases, I abbreviated the full response to get just one or a few words, which is written first after the number. Then I put my interpretation/synopsis of their response (*in italics in parentheses*). For example, for Respondent #6, the respondent answered only "equipment." I interpreted that to mean that he or she thought there was a training need using appropriate equipment, so I categorized it as "training." Then I put my interpretation (*in italics in parentheses*) so that it would be clear what the respondent said compared to what I interpreted. Next, I identified major themes from all of the responses based on the number of occurrences of a word, idea, or theme and identified that separately. See code chart below where major themes are coded either in **color**, **bold**, or underlined. PLEASE be honest and tell me what you think. It is perfectly OK to disagree with me or question how I interpreted the respondents' words.

I am requesting that you please 1) read through the Excel spreadsheet of answers and 2) compare to each number on this sheet to see if you confirm my interpretation. If you think the respondent actually meant something else, or that his or her answer should be coded into a different category, 3) write your interpretations or thoughts or comments right on this same sheet to make it easy for you. Thank you so much for your assistance. If you are unable to do this right now, please feel free to decline. I know it is a lot of work and I truly appreciate it. It is your input and participation that make the results valid and meaningful.

Responses:

1. Coordinated logistical support (*interoperability*)
2. Triage
3. **MOPP levels...MTF [medical treatment facility] involvement** (*training, realistic*)
4. **Standardization among agencies** (*interoperability*)
5. **Command and control, communication** (*leadership, communication*)
6. Equipment (*training*)
7. Unsure what we will be getting
8. Practice (*training*)
9. Earthquake (*training*)
10. Planning, **coordination** (*leadership*)
11. Not sure
12. **Training** (real)
13. **Training** (earthquake)
14. **Communication**

15. Preparation for ops other than war (**training**)
16. CBRNE [chemical, biological, radiological, nuclear, & explosives] + MOPP (**training** *austere compromised environment*)
17. **Training** (unknown)
18. **Triage** specific to disaster
19. Chem/bio exposures
20. **Training** more often (*realistic*)
21. Exercises, **triage**, AE (**training**)
22. Casualty tracking
23. **Training** (*realistic*, *role knowledge*)
24. **Ability to function with civ/mil**
25. **Interfly, multination** (*realistic*)
26. **Training** (drill with all team members, *role knowledge*)
27. **Realistic training** (*austere environment*)
28. "Move for the quick response" (*Sense of urgency*)
29. **Training** (plan, prep)
30. How to **work together on local and international level** ...understanding various militaries (*ability to function, role knowledge, multination*)
31. Incident command system (*leadership, communication*)
32. **Training**
33. *Role knowledge*
34. **Training** (regular)
35. **Interoperability mil/civ**, centralized command and control (*leadership, communication*)
36. **Leadership**
37. Team **leader training** (*austere environment*)
38. Field **training** (regular) (*austere environment*)
39. Readiness (**training**)

Major themes:

- **Training** (18 occurrences; 9 verbatim, 9 paraphrased)
- **Realistic** (6 occurrences)
- **Leadership, communication** (10 occurrences)
- *Austere environment* (5 occurrences)
- **Interoperability** (i.e., mil/civ, multi-national) (4 occurrences)
- *Role knowledge* (4 occurrences)
- **Triage** (3 occurrences)

LIST OF ABBREVIATIONS AND ACRONYMS

AE	aeromedical evacuation
AI	associate investigator
APMHE	Asia Pacific Military Health Exchange
DoD	Department of Defense
ERC	en route care
HADR	humanitarian aid and disaster response
MOPP	mission oriented protective posture
PI	principal investigator
USAF	U.S. Air Force